

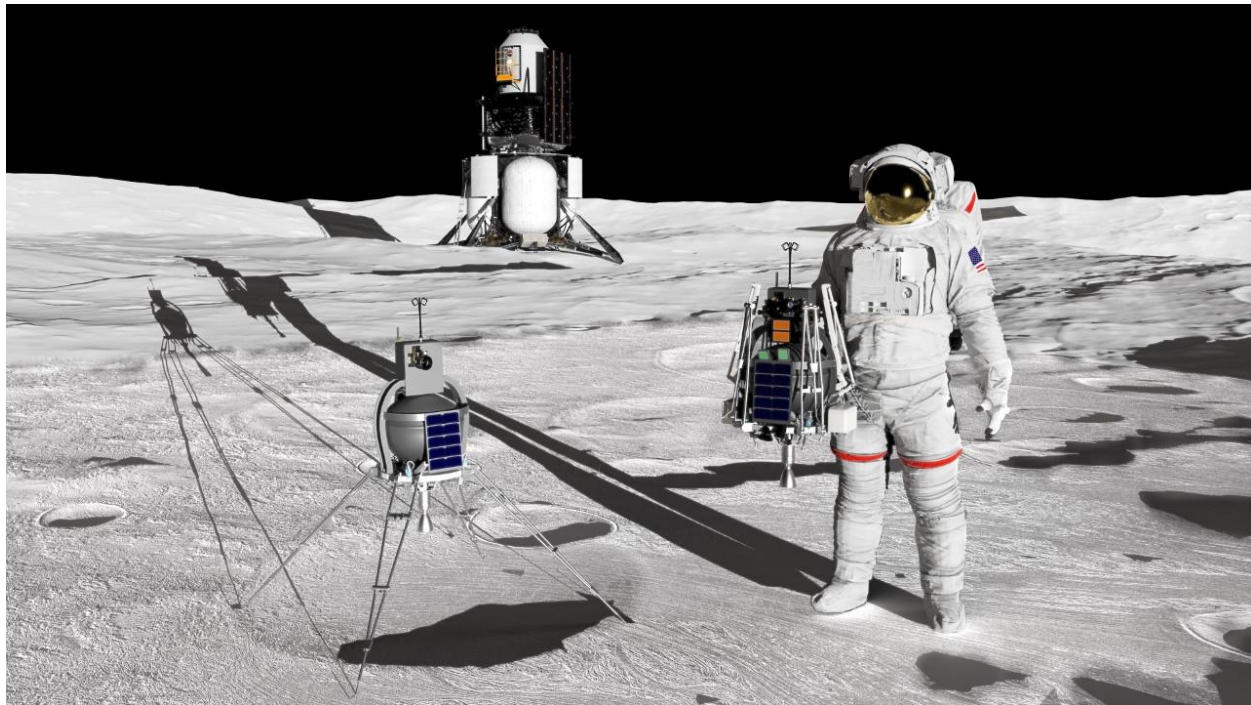
Reconnaissance Droid for Artemis-3, Steve Bailey & David Paige

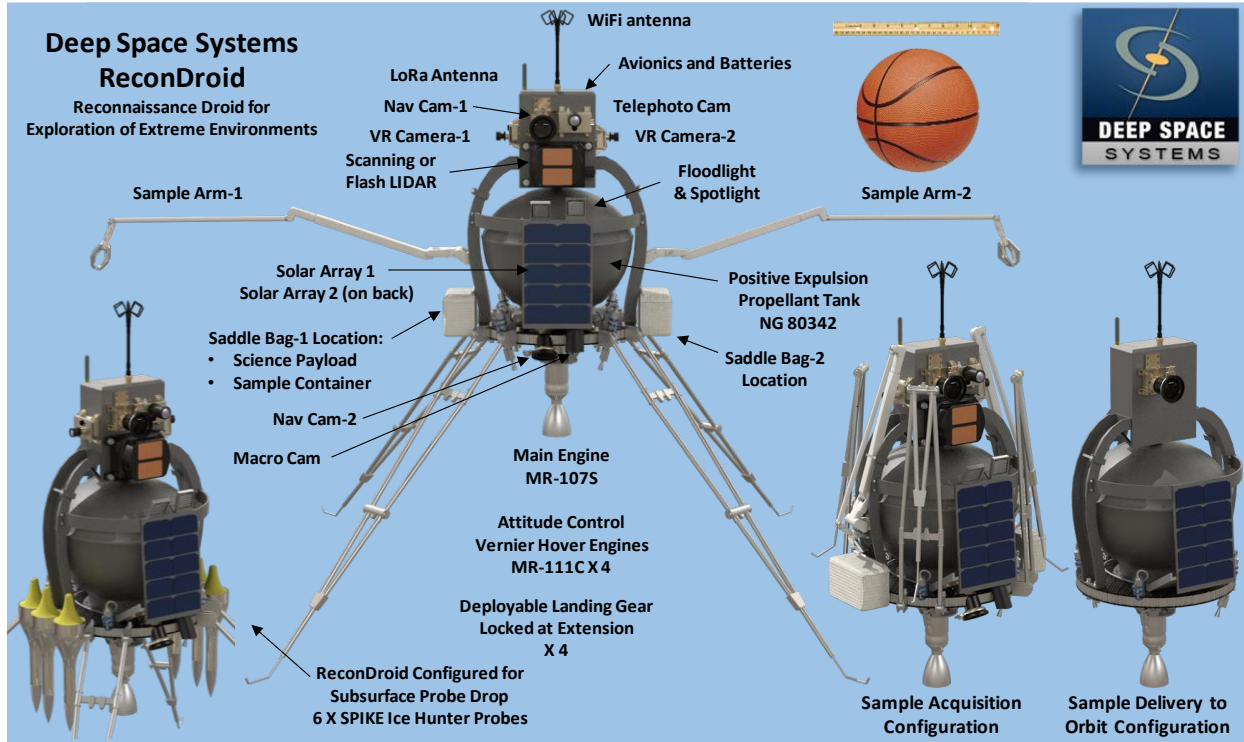
The Artemis-3 Crew will have extremely limited time on the surface - and restricted mobility while there. A Recon Droid will extend their reach in emplacing science instruments, making in-situ measurements and retrieving samples from otherwise inaccessible locations.

Deep Space Systems in Littleton, Colorado has created the concept of ReconDroid - a Reconnaissance Droid for Exploration of Extreme Environments that allows close-up observations, instrument emplacement and sample acquisition of areas that are hazardous or inaccessible to the Crew. A refuellable and reusable Droid will increase the effectiveness of the Crew in achieving various science objectives via sortie missions, and will demonstrate some key aspects of a new approach to sustainable and collaborative exploration including:

- New methods of realizing human/robotic synergy via both autonomy and teleoperation
- Ability to utilize the Gateway for teleoperation, to better support the surface Crew and meaningfully involve the orbital Crew team in surface operations
- Autonomous refueling advancing the principles of reuse and sustainability, dramatically increasing the quality, quantity and extent of science objectives achieved
- Providing an unforgettable perspective and documentation of the Crew and Landing Site

At 35kg wet mass, the ReconDroid is light enough to be carried and setup by a single Crew member. It is easily repurposed to different mission objectives like reconnaissance, in-situ surface measurements, sample acquisition, and payload delivery. The ReconDroid has sufficient performance and hover time to serve as a radio relay for instruments such as SPIKE penetrator probes dropped into permanently shadowed regions. The ReconDroid can hop in and out of inaccessible locations up to 30 km from the Landing Site, making in-situ measurements and/or recovering lunar samples via autonomous or telerobotic control. A stripped-down version of the Droid can actually reach Low Lunar Orbit with a sample cache.





The ReconDroid is a simple design with a blow down monopropellant propulsion system and a simple propellant transfer method.

It is equipped with an Ultra High Definition (UHD) Virtual Reality (VR) camera system, dual vision navigation cameras, macro and telephoto cameras, a high intensity LED spotlight and floodlight and is provisioned to carry up to 12 kg of science equipment. Local and remote line of sight communication support surface, orbital and Earth based command and control.

The ReconDroid is an example of the new kind of tools and methods available to support Artemis, enabled by advances in key technologies since the Apollo missions. We should be seeking to augment orbital and surface crews with this new class of science tool.

